



## NASA's Dawn Mission

# Physics Teachers

### Educational Materials Field Study

#### Introduction

In 2006, NASA's Dawn mission will begin its trek to investigate Ceres and Vesta, two of the largest protoplanets remaining intact since their formations. The mission will address the role of size and water in determining the evolution of the planets by measuring their mass, shape, volume, and spin rate with imagery, laser altimetry, and gravity. Through this investigation, scientists aim to characterize the conditions and processes of the solar system's earliest epoch.<sup>1</sup>

The Education and Public Outreach (E/PO) for the Dawn mission consists of a national team of E/PO specialists from the University of Maryland, New Roads Schools in California, and Mid-continent Research for Education and Learning (McREL). In support of the Dawn mission, this team develops and disseminates high quality resources and materials that reflect "best practices" in education. As such, Dawn E/PO curriculum materials are standards-driven, pedagogically appropriate, and designed to meet the needs of all students, including disadvantaged and underserved. Through their educational resources and materials, the Dawn E/PO team aims to improve students' understanding of the formation of the solar system, interest in solar-system science, and opportunities to conduct science within real-life contexts. The Dawn E/PO effort also intends to help science educators gain a better understanding of how to implement inquiry processes that lead to improved practices.

#### Study Purpose

The purpose of this field study is to ensure that the Dawn E/PO curriculum materials are of high quality and utility and reflect the needs of classroom science educators before they are disseminated to public and educator audiences. This study will allow the Dawn E/PO team to assess the appropriateness and effectiveness of the supplemental science materials in supporting science instruction and learning. This field study will also measure the impact of the Dawn E/PO curriculum materials on student understanding of and interest in physical science concepts related to an ion propulsion system. The Dawn E/PO team is currently recruiting high schools that are interested in participating as field-test sites for the *Ion Propulsion* module. This module is intended for high school 11<sup>th</sup> or 12<sup>th</sup> grade students enrolled in physics classes. Additionally, this module might be of interest to students as they conduct research in advanced technologies. As students interact with this module, they will gain an understanding of

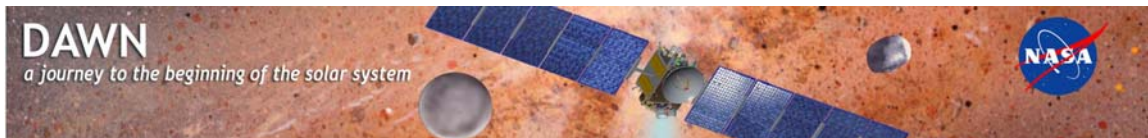
- charges and relative charge
- momentum and frames of reference
- ionization and plasma
- how an ion propulsion system works

#### Dawn E/PO Field-test Sites

As part of the Dawn E/PO development process, all curriculum materials are pilot and field tested before broad dissemination. *Ion Propulsion* is undergoing review in pilot

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<sup>1</sup> Dawn: A Journey to the Beginning of the Solar System (2002). The online site for the Dawn mission. Retrieved from the World Wide Web, June 5, 2003, <http://www-ssc.igpp.ucla.edu/dawn/>.



sites during the fall 2005 semester and field-test sites during the spring 2006 semester. As a result, the materials your school will field test will have been thoroughly reviewed and modified based on pilot-test results. Field-test participants will have the opportunity to use and provide additional feedback on these innovative supplemental science materials.

### **Design**

The evaluation study will be conducted with 11<sup>th</sup> and 12<sup>th</sup> grade physics during the Spring of 2005. The following data collection mechanisms will be employed for the field study:

- \* Post-activity student interest and knowledge questionnaire
- \* Post-activity performance assessment
- \* Teacher informational online questionnaire (before implementation)
- \* Teacher module evaluation online survey (after implementation)
- \* Teacher and student demographics

### **Participation**

Participating teachers will be expected to implement the materials as fully as possible and participate and support all data collection activities during the study. This is critical, given that the E/PO team's ability to improve the quality, utility, and effectiveness of the Dawn E/PO materials depends on the thoughtful and comprehensive feedback from participating teachers. In recognition of their participation, teachers will receive electronic copies of all E/PO field-test materials and designation as a NASA E/PO Field Associate.

No student, teacher, or school names will be used in reporting. If a reference is made to a school or teacher, it will be replaced with a pseudonym. All data will be reported in aggregated form, and no individual student data will be reported.

***If you are interested in being considered for participation as a field-test site, please contact a member of the Dawn E/PO team or return the attached FAX form.***

### **Contact Information**

For information regarding the field study contact:

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Dawn E/PO Principal Evaluator, Magnolia Consulting, LLC  
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For information regarding Dawn E/PO materials and resources contact:

Joe Wise  
Dawn E/PO Manager, New Roads School  
310.828.5582 Ext. 13  
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Dawn E/PO Lead Consultant, McREL  
303.632.5620  
[jristvey@mcrel.org](mailto:jristvey@mcrel.org)



# FAX

## LETTER OF INTEREST FOR THE Dawn E/PO Ion Propulsion FIELD TEST

TO: McREL E/PO Site Recruitment c/o Dawn Fries

FAX #: 800.337.3005

DATE: \_\_\_\_\_

FROM: \_\_\_\_\_

SCHOOL/DISTRICT: \_\_\_\_\_

PHONE: \_\_\_\_\_

ADDRESS: \_\_\_\_\_

EMAIL: \_\_\_\_\_

Dear McREL E/PO:

We are very interested in participating in a field test of the Dawn E/PO supplemental science materials. We look forward to working closely with Mid-Continent Research for Education & Learning (McREL) and the Dawn E/PO team to determine whether our site will be one of the final sites chosen to participate in this study.

Sincerely,

Please answer the following questions:

1. Are you a representative of your school or district? ☐ school ☐ district
2. Are there other physics teachers in your school or district who may be interested in field testing? ☐ no ☐ yes (please list names and contact information)

3. What is the demographic location of your school?  
☐ Urban ☐ Rural ☐ Suburban ☐ Other \_\_\_\_\_

4. If you are representing your school, who can we contact at the district to discuss this study?

Contact name: \_\_\_\_\_

title: \_\_\_\_\_

phone: \_\_\_\_\_

e-mail: \_\_\_\_\_